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DEPARTMENT OF THE INTERIOR

UNITED STATES BUREAU OF MINES
JOHN W. FINCH, DIRECTOR

INFORMATION CIRCULAR

BITUMINOUS COAL-MINE SAFETY-INSPECTION OUTLINE

BY

G. W. GROVE AND W. J. FENE

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BITUMINOUS COAL-MINE SAFETY-INSPECTION OUTLINE[1]

By G. W. Grove[2] and W. J. Fene[3]

An important activity of the Safety Division of the Bureau of Mines, in its efforts to reduce accidents, is the safety inspection of mines. Inspections are made at the request of the operators and are not connected with the inspections by the various State departments of mines. The operating management is furnished with a confidential report of the results of the Bureau's inspections, with recommendations for elimination of the hazards found. These mine-safety inspections include a study of mining practices, conditions, and equipment and in some cases the sampling and analysis of mine air and coal dust.

The Bureau of Mines has no regulatory powers, therefore the recommendations made in these reports are merely suggestions, and operators are not required to adopt them.

Mine inspections are a check on safety standards, methods, and practices and are essential to any accident-prevention program. A foreman or superintendent may be sincere in his efforts to operate a mine safely and believe that he has done everything possible to attain this end. However, experience has shown that because of his familiarity with the mine and the consequent "nearness" of its various features many unsafe conditions may be, and in most cases are, overlooked; an inspector, particularly an outsider who is trained to look for hazards, can point out the unsafe conditions overlooked by the foreman or superintendent.

Some companies employ safety engineers who make regular inspections of their mines, report substandard conditions and hazards found, and make recommendations for correcting them. Unless these recommendations are carried out the inspections have little value. In making recommendations, due consideration should be given to the feasibility of carrying them out; the management may and very often does consider a recommendation impracticable because of the cost involved in putting it into effect; but in most cases, if the recommendations are made by a competent safety inspector, an actual saving will be effected by the expenditure necessary to correct existing hazards.

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[1] The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6829."

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A mine inspection, like any other investigation, should be made in accordance with a definite plan or outline; as a result of years of experience in making mine inspections, Bureau of Mines engineers have compiled a standard outline representing the data essential for the preparation of a detailed mine-inspection report. The outline, prepared in convenient booklet form, is comprehensive and covers practically every condition that may be found in and around bituminous-coal mines. It is published here with the hope that it may be found useful to those making mine inspections and preparing reports thereon. In using this outline at a mine for the first time, the inspector should record the information as completely as possible, so that in subsequent inspections of the same mine it will be necessary to note only changes in conditions or practices since the last inspection. The outline is so inclusive that many of the provisions will be found not applicable to any certain mines, and on the other hand there are very few mines or types of mines that the outline would fail to cover with regard to essential safety features. The outline has been in use by Bureau of Mines field safety men for several years, and the following is a relatively recent compilation embodying some features added through suggestions received from the field men of the Bureau's Safety Division.

SAFETY-INSPECTION OUTLINE FOR COAL MINES

1. Engineer making inspection__________
2. Date of inspection__________

GENERAL INFORMATION

3. Name of mine__________
4. Name of operating company__________
5. Mine location (State, county, town, distance and direction from town, railroad)__________
6. Name and address of operating officials:
   a. President__________
   b. Gen. mgr. or gen. supt.__________
   c. Chief engineer__________
   d. Superintendent__________
   e. Safety engineer__________
   f. Mine foreman__________
7. Other mines operated by same company__________
8. To whom should report be sent?__________
   Address__________
9. History of mine and district. (Give approximate date mine was opened. Make statement as to explosions, fires, or other disasters occurring in this mine, and fires and explosions occurring in adjoining or adjacent mines working same coal bed.)__________
10. Type of mine:
   Drift__________
   Slope______; pitch______; length______
   Shaft__________; depth______
11. Coal bed:
   a. Geological and local designation__________
      Average thickness______ Dip______
      Kind of coal______ Maximum cover______
   b. Number of beds worked__________
   c. Impurities (variability and character)__________
   d. Analysis of coal__________
   e. Ratio of volatile to total combustible__________

12. Number of employees:
    a. Underground____________________
    b. Surface____________________
    c. Loaders____________________
    d. Daymen____________________
13. Production:
    a. Daily average____________________
    b. Maximum daily____________________
    c. For year____________________
    d. Probable life of mine____________________

SURFACE PLANT AND EQUIPMENT

14. Tipple or cleaning plant:
    a. Construction____________________
    b. Fire protection____________________
    c. Sizes of coal produced____________________
    d. Type of screens____________________
    e. Wiring properly installed____________________
    ____
    f. Dust hazard, precaution taken____________________
    ____
    g. Frequency and method of cleaning____________________
    ____
    h. Stairways: Adequate____________________
    Guarded____________________
    i. Machinery and belts guarded____________________
    ____
    j. Safety and method of handling railroad cars____________________
    ____
    ____
    k. Any other hazards noted____________________
    ____
    ____
    ____
15. Refuse disposal:
    a. Dump car__________ Larry__________
    Aerial tram__________ Truck__________
    b. Distance of waste dump from intake opening____________________
    c. Hazards in connection with refuse disposal (describe)____________________
    ____
    ____
    ____
16. Coal-storage bins:
    a. Capacity and distance from mine openings____________________
    b. Spontaneous fires in storage of coal____________________
17. Headframe (if shaft mine)____________________
    a. Is there a railed platform at head sheaves?____________________
    b. Railed stairway leading thereto?____________________
    c. How often are sheaves inspected and oiled?____________________
    d. Is this inspection recorded?____________________

18. Surface haulage (if drift or slope):
    a. Condition of track__________ Road bed__________
    b. Clearance__________
    c. Are frogs and guard rails blocked?__________
    d. Slope leading to surface:
        Condition of track__________
        Type of drags used--derails or safety blocks__________
        ____
        Clearance__________
    e. Outside planes or inclines__________
        Pitch__________ Length__________
        Positive stop blocks at top__________
        Derail near top__________
        Derail near tipple__________
        Drags__________
        Is barney or monitor used?__________
        Are man-trips operated on surface planes?__________
        What safety precautions are taken?__________
        ____
19. Hoisting equipment:
    a. Type__________ How driven__________
    b. Overwind device__________ Speed control__________
        Other safety features__________
        ____
    c. Enginehouse:
        Construction__________
        Fire protection__________
    d. Are hoisting engines placed so that noise of other machinery will not prevent engineer from hearing signals?__________
        ____
    e. Are periodic physical examinations given engineer?__________
    f. Is hoisting equipment inspected?__________
        How often?__________ By whom?__________
20. Cages:
    a. Type__________
    b. Bonnet:
        Bars or chains across ends__________
        Lining or rail and toe board on guide sides__________
        Hand holds__________
        Bridle chains__________
    c. Safety catches:
        Frequency of tests__________
        Is record kept of tests?__________
    d. How often are cage, guides, and shaft lining inspected?__________
    e. Is there a positive stop block at surface landing?__________
    f. Kind of gates provided at surface landing__________
    g. Is cager in charge while men are riding on cage?__________
    h. Maximum number of men allowed on cage__________
    i. Method of signaling__________
    j. Are movable parts locked while men are riding on cage?__________

k. Are tools carried on cage with men?________________
l. Speed at which men are hoisted________________
m. Can signals be given from cage?________________
21. Steam plant:
a. Number of boilers__________ Size_________ Type__________
b. Building________________
c. How often are boilers inspected?________________
d. Safety devices________________
e. Number of exits from boiler room________________
22. Electric power plant:
a. Number of generators__________ Type________________
Alternating current or direct current________________
Voltage________ Kilovolt amperes or kilowatt rating__________
Properly grounded________________
b. Safety of installation________________
____
c. Kind of building________________
Fire protection________________
d. Switchboard________________
Adequately guarded________________
Rubber mat on floor________________
e. Fire hazards________________
f. Oil storage________________
g. Cleanliness________________
h. If power purchased, from whom?________________
i. Voltage received at________________
j. Auxiliary power lines________________
23. Surface transformer station:
a. Are transformers well-installed?________________
Type of building________________
b. How guarded or enclosed?________________
c. Is door or gate kept locked?________________
d. Are transformers properly grounded?________________
e. Voltage incoming________________ Outgoing________________
f. Are proper lightning arresters installed?________________
24. Substation:
a. Kind of building________________
Fire protection________________
b. Motor-generator sets________________
Voltage, alternating current__________ Direct current__________
c. Properly grounded________________
d. Switchboard:
Adequately guarded________________
Rubber mat or insulated platform on floor________________
e. Circuit breakers and fuses________________
f. Is door to building kept locked?________________
25. Surface power and trolley lines:
a. Height of trolley wire above rail________________
b. Guarding of wires, method________________
c. Securely supported on insulated hangers________________
d. Alinement________________

26. Shops:
    a. Building ____
       Fire protection ____
    b. Wiring ____
    c. Machine and belt guards ____
    d. Open repair pit ____
       Is pit covered when not in use? ____
    e. Use of goggles ____ Type ____
    f. Condition of hand tools ____
    g. Cleanliness of building ____
    h. Safety of electrical equipment ____
       ____
    i. Illumination ____
    j. How heated ____
27. Fan and fanhouse:
    a. Type of fan ____ Size ____ Capacity ____
    b. How driven ____
       Operating exhausting or blowing ____
    c. Is there reserve power? ____ Auxiliary fan? ____
    d. Location of fan in relation to opening ____
    e. Can air current be reversed? ____
       If so, how often tested? ____
    f. Explosion doors or weak wall ____
    g. Water gage ____ Kind ____
    h. Signal device to show when fan slows down or stops ____
    i. Are fan and fanhouse casing of incombustible material? ____
    j. How often inspected? ____ By whom? ____
    k. Is fan on independent circuit? ____
    l. Is fan run continuously? ____
    m. When stopped are men all out of mine? ____
    n. How long before men enter is fan started? ____
28. Explosives storage magazine:
    a. Material of construction ____
    b. Kind of floor ____
    c. Capacity ____ Maximum stored ____
    d. Distance from nearest mine entrance ____
       From nearest building ____
       From public highway ____
       From transformer ____
    e. Barricaded? ____ How? ____
    f. Danger signs properly located ____
    g. Properly screened ventilators ____
    h. Illumination of magazine ____
       Location of switch ____
    i. Is other material stored in magazine? ____
    j. Is area around magazine kept free of dry grass and brush? ____
       Cleanliness of magazine ____
    k. How is excess summer temperature prevented? ____
    l. How secured against unlawful entry? ____
    m. Frequency of delivery to ____

n. Are explosives inspected on arrival?____________________
o. Is fuse tested to determine burning rate?____________________
p. What disposal is made of old explosives and detonators?__________
____

29. Distributing magazine:
a. Material of construction______________________________
b. Distance from nearest mine opening________________________
From nearest building__________________________________
c. Is more than 1 day's supply of explosives kept in magazine?________
____
d. Illumination of magazine______________________________
Location of switch___________________________________
e. Tools used for opening boxes____________________________
f. Are there separate distributing magazines for explosives and detonators?______________ Distance apart_________________
g. Are other things stored with explosives?______________________
With detonators?_____________________________________
h. Do unauthorized persons enter magazine?______________________
i. Method of distributing explosives___________________________
j. How are explosives delivered to magazines?____________________

30. Wash-house:
a. Description____
b. Fire hazards_______________________________________
c. Cleanliness____
d. Are toilet facilities provided?____________________________
e. Illumination_______________________________________
f. How heated____

31. Supplyhouse:
a. Construction_______________________________________
b. Fire protection____________________________________
c. Orderly method of storing_____________________________
d. Illumination_______________________________________
e. How heated____

32. Lamphouse:
a. Construction_______________________________________
b. Equipment____
c. Kind of lamps______________________Number______________
d. Maintenance____
e. Where is naphtha stored?______________________________
f. Illumination_______________________________________
g. How heated____

33. Other buildings: Describe______________________________
____
____

34. Yards and material storage:
a. Are roads, paths, and walks kept free from obstructions?__________
b. Are timbers, ties, and rails properly stored and piled?___________
c. Are scrap iron and old cars properly stored?___________________

35. Surface fire protection:
a. Is any inflammable building within 100 feet of mine opening?______
b. Describe fire protection provided___________________________

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c. Is fire extinguishing equipment tested?________________
How often?________________

d. Method of storing oil on surface________________
Describe any hazards________________

36. Water supply, sanitation, housing of employees________________
____
____
____

37. System of checking men into and out of mine: Describe________________
____

UNDERGROUND MINING METHODS, CONDITIONS, AND EQUIPMENT

38. System of mining (longwall, room-and-pillar, butt entries, panels, long faces, etc.)________________

a. Is mine laid out with reference to butts and faces?________________
b. Number of main entries (two, three, four, etc.)________________
c. Distance between levels or cross entries________________
d. Number of side entries (double, triple, etc.)________________
e. Entry width________________ Pillar width________________
Brushed________________ Distance between crosscuts________________
f. Rooms: Width________________ Pillar width________________
Length________________ Distance between crosscuts________________
g. Are rooms turned off aircourses?________________
h. Are rooms of one entry driven into rooms of an adjacent entry?____
____
i. Are pillars recovered?__________Describe method________________
____
____
Is a definite pillar line maintained?________ What method is used to maintain pillar line?________________
____
j. Is coal cut or sheared?________ Is cutting done in floor or coal?________________Are cuttings left in mine or loaded out?________________ Are cuttings loaded out before or after shooting?________________ Depth of cut or shear________________
k. Proportion of coal recovered in advance work________________
l. Total recovery, excluding roof coal________________
Including roof coal________________

39. Roof and floor:

a. Immediate roof (kind and quality, thickness of drawslate or roof coal)________________
____
b. Main roof (kind, average thickness, maximum cover)________________
____
c. Frequency of slips, rolls, pots, horsebacks, faults, and clay veins________________
____
d. Floor: Kind________________Soft or hard________________
Smooth or rough________________

40. Timbering:

a. Entry timbering:

Is dangerous or doubtful slate, rock, or coal promptly taken down? ________ Or timbered? ________

When? ________

Method of timbering ________

____

Are entries adequately timbered? ________

Are safety posts used? ________

b. Room timbering:

Is dangerous or doubtful slate, rock, or coal promptly taken down? ________ Or timbered? ________

When? ________

Number of rows of posts ________ Distance between posts ________ Or cross bars ________

Distance from face ________

c. System of timbering in pillar work ________

____

d. Are prepared cap pieces and wedges provided? ________

Size ________

e. If prepared cap pieces are not provided, are those used adequate?

____

f. Is the coal spragged after undercutting? ________

g. Recovery of timber:

Method used in removing safety posts ________

Are timbers recovered? ________ How? ________

____

Who supervises timber recovery? ________

h. Timbering regulations:

Are there systematic timbering rules? ________

Verbal or printed? ________

Is timbering outline provided? ________

Are timbering rules strictly enforced? ________

i. How is roof tested? ________ How often? ________

41. Explosives and blasting:

a. Method of transporting explosives underground and to face ________

____

b. Type of explosives car used ________

c. Type of receptacle used for carrying and storing explosives underground ________

Detonators ________

d. Storage underground:

How? ________

Where? ________

e. Maximum amount of explosives allowed miner per day ________

f. Explosives:

Kind for blasting coal ________

Brushing ________

Size and weight of cartridges ________

g. Detonators: Electric ______________________________
Strength ______________________________
Are ends of legs shorted? ______________________________

h. How, where, and when is primer made? ______________________________
____

i. Firing method:
By electricity from surface ______________________________
Electric power lines in mine ______________________________
Battery ______________ Kind ______________
Permissible ______________ Fuse ______________
Squibs ______________ If fuse or squib, how ignited?
____

j. Firing cables:
Single or twin conductors ______________________________
Condition, as to length ______________________________
As to insulation ______________________________
Is cable wound up after each shot or left strung out in gob or on timbers? ______________________________
Is battery end of cable kept shorted? ______________________________

k. Charge:
Maximum and average amount ______________ ______________
Distance apart and depth of holes (with total and respect to depth of cut) ______________________________
Are mixed charges allowed? ______________________________
Position of primer in charge ______________________________
Direction detonator points ______________________________
Tool used for making hole in cartridge for detonator ______________
____

l. Loading holes:
By whom ______________________________
Are cartridges slit? ______________________________
Is explosive rammed? ______________________________
Are charges air-spaced? ______________ If so, how? ______________
____
How is hole cleaned out?

m. Stemming:
Material used ______________________________
Prepared in dummies ______________ Length of dummies ______________
Are holes stemmed to the collar? ______________________________
Type of tamping bar ______________________________
Is face region kept free from coal dust? ______________________________

n. Blasting:
By whom done, miner or shot firer ______________________________
Number of shot firers ______________________________
Are shot firers certified men, and what grade certificate? ______________
____
Number of shots fired at one time ______________________________
Time of firing ______________ Are men out of mine? ______________
Are tests for gas made before and following shooting? ______________
Are fire runs made after shooting? ______________________________
Is ample warning given before shooting? ______________________________
How? ______________________________

What precautions are taken when two places are coming together?

If shot firers are used, do they make written report of amount of explosives used, condition, etc.?

o. Are adjacent shots fired simultaneously?
   Are dependent shots fired?
   Are nearby shots fired in rapid succession?
p. Do blown-out shots occur?
q. Are bulldozing shots ever used?
r. Misfires:
   Care and method of examination
   Interval before return
   Method of removal
s. Careless use or handling of explosives, detonators, fuse, squibs, etc. (Describe)

t. If black blasting powder (granular, pellet, or stick) is used, describe method of handling

u. Are open lights used near explosives?

42. Ventilation and gas:
   a. Volume of air:
      Main intake
      Main return
      Number of splits
      Volume, each split
      Volume, last open crosscut on each split
   b. Aircourses:
      Are they adequate in number and size?
      Obstructions (describe)
   c. Maximum number of men employed on one split of air
   d. General adequacy of air at working faces
   e. Line brattices:
      Are they used in working places?
      Are they extended close enough to face?
      Is board used at top and bottom?
      Is there enough space between brattice and rib?
      Are brattices well-maintained?
   f. Crosscuts:
      Maximum distance between
      Is more than one crosscut open between last stopping and face?
   g. Old workings:
      Ventilated or securely sealed
      Type of seal
      Does air from old workings pass through working places?
      Method, if any, of relieving gas pressure behind seals
      Is provision made for sampling air behind seals?
      What is nature of atmosphere behind seals?

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h. Is a good ventilation map maintained? ____________________
i. Booster and blower fans in mine:
Number __________ Type ____________________
Are fan intakes in fresh air? ____________________
Volume of air passing fan intake ____________________
Volume of air supplied by blower ____________________
Type of fan tubing ____________________
Condition ____________________
j. Stoppings:
Material of construction, entries ____________________
Rooms ____________________
Are stoppings well sealed into rib and roof? ____________________
Are entry stoppings at intervals provided with small openings?
__________ Size of opening __________ Type of door ____
k. Overcasts:
Material of construction ____________________
Are approaches easy or abrupt? ____________________
l. Doors:
Number __________ Construction ____________________
Condition as to tightness ____________________
On main haulageways ____________________
In pairs or singly ____________________
Are doors equipped with latches? ____________________
What would be the effect or danger if doors were left open? ____
____
____
Are trappers employed? ____________________
m. Regulators:
Number __________ Type ____________________
n. Is mine rated as gassy by State mining department? ____________________
o. Frequency of gas being reported ____________________
p. May gas be liberated suddenly? ____________________
Is mine free from standing gas? ____________________
q. Is mine connected with a gassy or other mine? ____________________
Name ____________________
Is connection sealed or isolation otherwise afforded? __________
Describe ____________________
____
r. Gas inspection and testing:
By whom? __________ When? ____________________
How reported? ____________________
If gas is found, when and how is it removed? ____________________
____
Do firebosses carry open lights or electric cap lamps when making inspections? ____________________
Do firebosses use electric locomotives to travel in and out of mine? ____________________
Number of certified firebosses ____________________
Type of flame safety lamps used ____________________
Maintained by whom? ____________________

Are flame safety lamps examined and tested?__________
When?__________ How?__________
Do machinemen use flame safety lamps?__________
How are they trained in their use?__________

Type of methane detector used, if any__________
Is return air tested periodically?__________
Are places with standing gas fenced off?__________
Does fireboss leave evidence of his examination in each place?__________

Does fireboss record the results of his inspections?__________

s. Gas-ignition hazards:
Are locomotives, mining machines, pumps, or other electrical equipment operated on other than pure intake air?__________

Electric arcing or sparking, hazards from, if any__________

Is black blasting powder used?__________
Miners' lights, kind, number__________
Other mine illumination__________
Is smoking permitted underground?__________
Are men searched for smoking material?__________
Have accidents occurred from methane ignition?__________
Describe__________

t. Does the company regularly sample and analyze mine air?__________
Who analyzes samples?__________
Interpret and discuss analysis of air samples__________

43. Dust:
a. Accumulation of coal dust on roadways, rib, roof, timbers, or gob in working places (describe bad conditions)__________

b. Accumulation of coal dust on entries and aircourses (describe bad conditions)__________

c. Is coal used for track ballast?__________
d. Is coal topped above cars?__________
e. Are cars leaky?__________
f. Are ribs and roof dusty?__________ Dry or moist__________
g. Are roadways dry or wet?__________
h. Are accumulations of coal dust thoroughly removed?__________
How often?__________
i. Method of humidifying (describe)__________

j. Is water used to allay dust (at face, on mining machines while in use, on trips)?__________

Bottle No.	Location	Time	Date	Ane-mometer reading	Area	Cu. ft. air per minute	CH_4 reading in detector or lamp

Dust samples

Can No.	Location	Date	Rib, roof or road dust	Rock-dusted area

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k. Application of rock dust (describe in full)______________________

____

____

____

l. Samples and data as to incombustible (interpret and discuss analysis)______________________

44. Haulage underground:

a. System of haulage:
Main haulage______________________
Other haulage______________________

b. Grade, dips, curves, and alinement of track______________________

____

c. Road beds:
Ballasting material______________________
Wet or dry______________________
Cleanliness of road beds______________________

d. Track: Gage______________________
Weight of rails, main line________Side entries________Rooms________
Splice bars______________________
Tie plates, condition of______________________

e. Ties:
Material, size, spacing, condition of main line______________________

____

____

____

Side entries______________________
Rooms______________________

f. Proper curves, rails properly fastened down______________________

g. Switches:
Type______________________ Condition______________________
Clearance of throws and at switches______________________
Blocking______________________
Stumbling hazard of switch bar______________________
Illumination______________________

h. Frogs:
Guard rails______________________
Blocking______________________

i. Derails or safety blocks, location and general description__________

____

____

j. Clearance (roof, rib, timbering, and trolley or power wires):
On entries____________In rooms____________At partings____________
Is gob or other material stored on clearance side?____________
Other stumbling hazards______________________

____

k. Shelter holes:
Distance apart______________________Size______________________
How marked______________________Are they kept clean?__________

l. Underground hoists:
Location and ventilation______________________

____

Type________________________________

Safety (same information as for main hoist, guards, brakes, etc.)

____

____

____

Cleanliness________________________________

Illumination________________________________

Fire hazard and protection________________________________

Is electrical equipment properly grounded and fused?________________

Room hoists (describe hazards)________________________

m. Rope:

Condition and size________________________________

How often inspected, oiled, and resocketed?________________

Is written record of inspection kept?________________

Condition of rollers________________________________

If slope haulage, are effective drags used?________________

n. Locomotives:

Trolley, cable-reel, permissible battery, or combination____________

____

Number________________Type________________

Size________________________Voltage________________

General condition of________________________________

Headlights, condition of________________________________

Controller handle and covers fastened down________________

Are all motors equipped with gong?________________

Condition of cables and wiring________________________________

____

Condition of fuses, circuit breakers or switches____________

____

Type of nips used________________________________

o. Animal haulage:

Number and general condition of animals________________

____

Underground stable: Location, cleanliness, ventilation, fire protection, illumination, water supply________________

____

____

____

Do animals carry lights?________________________________

Where does driver ride?________________________________

p. Cars:

Material________________________Type________________

Capacity________________________Tightness________________

Brakes or sprags, safety and condition of________________

Type of couplings________________________________

Are they heat-treated at regular intervals?________________

q. Maintenance of haulage equipment:

Good________________Fair________________Poor________________

r. Illumination of haulageways:

Spacing of lamps________________________________

Size of lamps________________________________

Are lamps safely installed?________________________________

s. Are trip lights used on rear of all trips?____________
  On front of all pushed trips of three cars or more?____________
  On front and rear of rope trips?____________
t. How is haulage controlled (automatic block signals, dispatcher, or trapper)?____________
  How is too high speed prevented?____________
u. Blocking cars:
  Type of car stops used at working faces____________
  Are trips of cars left standing on entries blocked?____________
  If so, how?____________
v. Man-trips:
  If locomotive-hauled, maximum speed____________
  Is trip in charge of an official?____________
  Does trip come to full stop before men unload?____________
  Are tools carried in same car with men?____________
  Are explosives carried on man-trips?____________
  Do men get off moving trip?____________
  Is power cut off trolley wire or is it guarded at loading and unloading stations?____________
  Do men ride on trolley side?____________
  Are rails, lumber, or other supplies hauled on man-trip?____________
  If slope haulage, how is rope fastened to load?____________
  ____
  Does rope rider or other official familiar with signals ride man-trip?____________
  Is a safety coupling provided?____________
  Are safety couplings used?____________
  Is there an inspection of rope, couplings, and hoisting engine daily?____________
  Other safety precautions taken____________
  ____
  Are suitable waiting places with seats provided underground?____________
  ____
w. Miscellaneous haulage hazards:
  Cleanliness of haulageways____________
  Do men travel haulageways or are manways provided?____________
  ____
  Condition of manways____________
  Are gates provided where manway crosses haulageway?____________
  Is there a runaround at each shaft landing?____________
  Do men or officials ride loaded trips?____________
  Do haulage employees jump on or off moving trips?____________
  Are flying switches permitted?____________
  Is back-poling practiced?____________
  Is excessive nipping practiced?____________
  Do brakemen run ahead of moving trips to throw switches and to open doors?____________
  Are trips pushed?____________
  What method is used to rerail cars?____________
  Type of clothing worn by haulage employees____________
  Safety of position of trip rider on trip____________

45. Electricity underground:

a. Transmission lines:

How are lines taken into mine (drill holes, shaft, through drift opening)?__________

In intake or return airway?__________

Are power wires over 650 volts in armored cables?__________

Are power wires properly installed on insulators?__________

Are armored cables frequently grounded?__________

Location of power wires with respect to trolley wires__________

____

Are power wires adequately guarded at points where men must pass under them?__________

Are power wires insulated where they pass through doors, curtains, etc.?__________

Contact hazards__________

Arcing hazards__________

Sectional switches__________

Location__________Type__________

b. Trolley wires:

Is wire securely supported on insulated hangers?__________

Position and distance above and outside of track__________

Protection of crossings (describe)__________

Protection at other dangerous places__________

Fire hazard (contact with inflammable material)__________

Is wire on opposite side of track from clearance?__________

Is trolley wire sectionalized by cut-out switches?__________

Length of sections__________

Are trolley frogs and cut-out switches provided at branch roads?__________

Are terminals of trolley and feed wires cut off?__________

Are insulated turn buckles used?__________

Do trolley switches have insulated handles?__________

Are rails well-bonded?__________Cross-bonded?__________

Distance between__________

c. Storage-battery equipment:

Are battery locomotives used?__________

Permissible type?__________

Maintained in permissible condition?__________

Other equipment__________

Location of charging station__________

Ventilation__________

Condition of__________

d. Telephone system:

Number and locations__________

Permissible type__________

Operating condition__________

Are telephone wires located near power wires?__________

e. Signaling system:

Describe system__________

____

____

____

Voltage on wires______
Source of power______
Sparking hazards______
Is transformer effectively grounded?______

f. Shot-firing circuit (if shots fired from outside mine) (describe)
______
______

g. Underground transformer station:
Location______
Construction______
Is fire door provided?______
Ventilation______
Voltage, incoming______Outgoing______
Properly grounded______
Is wiring properly installed?______
Fire hazard and protection______
Contact hazard______
Cleanliness______
Is station kept locked?______

h. Underground motor-generator station:
Location and description______
Number M-G sets______Voltage, alternating current______
Direct current______Properly grounded______
Switchboard, adequately guarded______
Rubber mat on floor______
Circuit breakers and fuses______
Fire hazard and protection______
Is station kept locked______

i. Circuit breakers:
Automatic or hand-operated______
If automatic, are they properly adjusted?______
If hand-operated, are they tied in the "in" position?______

j. Coal-cutting equipment:
Number of machines______Type______Voltage______
Alternating current or direct current______
Are machines of permissible type?______
Are machines maintained in permissible condition?______
Are machines provided with separate ground circuits?______
Are machines properly fused?______
Is guard provided for cutter chain?______
Are machines kept in good repair?______
Inspected by whom?______
How often?______
Is inspection record kept?______
If inspection forms used, procure and include copy______
Is water used while cutting?______
How attached to power wire______
Give tabulation of defects observed on permissible equipment______
______
______

k. Cables:

Type used______________________ Condition______________

How are temporary splices made?______________________

____

How long are temporary splices used?__________________

Are cable splices electrically and mechanically strong?________

Are permanent splices vulcanized?______________________

Is permanent splicing done underground or on surface?________

____

Is a record kept of cable defects and repairs?____________

l. Pumps:

Number________________ Kind______________________

Permissible type______________________________

Condition of wiring____________________________

Open or enclosed switches______________________

Fuses____________________ Properly grounded__________

Insulated platform provided____________________

Gears properly guarded________________________

Are pump and wiring protected from roof falls?____________

On intake or return airways____________________

m. Mechanical loaders, conveyors, scrapers, etc.:

Give brief description of method of working______________

____

____

____

Kind____________________ Number______________

Permissible type______________________________

Condition____________________________________

Apparent hazards______________________________

Accidents____________________________________

Number of men on crew__________ Duties of each__________

____

Tons of coal per machine________________________

Is water used on coal or machine?______________________

Are machines grounded?______________________________

Type of switches______________________________

Fuses or circuit breaker________________________

Is machine stopped frequently to test roof?______________

Illumination__________________________________

Dustiness____________________________________

n. Other electrical equipment:

Miscellaneous motors, etc.______________________

____

o. Inspection of electrical system and equipment:

By whom, how often, how reported?______________________

____

46. Fire protection underground:

a. Are there fire-protection pipe lines throughout the mine?________

b. Frequency of water taps______________________________

c. Is hose kept at stations underground?__________________

How many stations?______________________________

d. Length and diameter of hose____________________

e. Fire extinguishers:

Number and kind____________________

Where located____________________

f. Is water always available?____________________

g. Are brattice cloth and other emergency fire-fighting equipment and supplies available?____________________

47. Protective clothing:

a. Type of goggles used____________________

Are they worn continuously underground?____________________

b. Type of safety hats used____________________

c. Safety shoes used____________________

d. Other protective clothing____________________

e. What has been injury-reduction experience since adopting protective clothing?____________________

____

____

48. Miscellaneous hazards:

a. Mine fires (hazards, method of prevention, fire-fighting methods and equipment)____________________

____

____

Is coal subject to spontaneous fires?____________________

b. Flood hazard:

Is there an accumulation of water in adjoining mine?____________________

Head of water________feet. Is barrier maintained?____________________

Thickness________feet.

Are workings under stream or body of water?____________________

Are openings subject to probable hazard from flood or cloudburst?____________________

Are openings protected?____________________

Method of approaching abandoned or standing workings filled possibly with water or gas____________________

____

Are emergency escapeways maintained?____________________

c. Tools:

Are miners required to provide full sets of tools?____________________

Is periodic inspection of tools made?____________________

By whom?____________________

Were any faulty tools observed?____________________

Length of ax handles, if used____________________

d. Oil and gas wells:

Are there oil or gas wells penetrating coal measure?____________________

Active____________________Abandoned____________________

Are wells protected by coal pillars?____________________

Size of pillar____________________

Are abandoned wells properly filled?____________________

Are wells accurately located on mine map?____________________

e. Storage of oil and other inflammable material____________________

____

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f. Supplies and materials:
Carelessness in handling and storing timber, ties, rails, cap pieces, gob, etc., along track or in working places (describe) ______

g. Give data on any other hazards noted ______

GENERAL SAFETY CONDITIONS

49. Supervision and discipline:
a. What are your general impressions regarding type and character of officials from your observations of the appearance and operation of the mine, both inside and out? ______
b. How many men are working under each face boss? ______
c. How many times per day does he visit each working place? ______
What is the total daily number of visits made by the various officials to each working place? ______
d. Are they hurried in their visits because of size of territory, or do they have time to inspect each working place properly? ______
e. Do officials mark the date and their initials at face of each place visited? ______
f. When they give orders, do they insist that they be carried out by the men? ______
g. If men fail or refuse to carry out orders, are they disciplined in any way? ______
h. Are face bosses required to perform other than supervisory work? ______
i. Are face bosses certified men? ______
j. Does discipline appear to be good? ______
Fair? ______ Poor? ______
k. Do men appear to receive orders without resentment? ______
l. Are orders willingly carried out? ______

50. Safety organization:
a. Is a safety organization maintained? ______ Describe ______
b. Is a safety engineer or inspector employed? ______
c. Describe in detail methods used by company officials and miners' committees in maintaining and promoting interest of employees in safety ______
d. Does there appear to be a spirit of cooperation between the men and company officials relative to accident prevention? ______

e. Is there a spirit of rivalry between this mine and other mines of this same or other companies regarding accident prevention?_____

____

f. Is there a bonus system by which the officials or miners are rewarded for good accident records and penalized for poor accident records?____

____

____

51. Safety rules and standards:

a. Is there a definite set of mine rules or operating standards covering the general operations of the mine and the proper method of performing the various usual kinds of work?_______________

____

b. Are these rules printed?___________In what form?_______________

c. What method is used to acquaint employees with mine rules?________

____

d. Do the officials insist upon the enforcement of these rules?______

____

52. Safety meetings:

a. Are safety meetings held?_________How often?_________________

b. Do meetings include both men and officials?_______________

c. Are safety rallies, including women and children, held?__________

How often?____

d. What other means are used to maintain interest in safety?________

____

____

53. Bulletin boards:

a. Is a safety bulletin board provided?_______________________

b. Are safety bulletins provided?_____________________________

c. In what other effective manner is safety literature distributed to miners?____

54. First aid and mine rescue?

a. How many men have been trained:

First aid____________________ Mine rescue____________________

Advanced mine rescue__________ Accident prevention___________

b. Are men given additional training?_________________________

How often?____

c. Are employees instructed in the use of barricades?____________

d. Is there an underground hospital or first-aid station?__________

e. Is adequate material provided?_____________________________

f. Nearest general hospital__________________________________

g. Breathing apparatus:

Number_____________________Type_______________________

h. Is apparatus in condition for wearing?______________________

i. How often tested?_____________By whom?____________________

j. Condition and amount of supplies___________________________

k. Number and type of gas masks______________________________

Condition____

l. Are self-rescuers used?____________________________________

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m. Is a mine rescue-crew maintained?

n. Does this mine have access to a joint or State-owned rescue-station?

(Note: A report of privately owned mine rescue-station should be made on a special form provided for that purpose.)

55. Accidents:

a. What has been the accident experience for the last several years?

Are accidents investigated? Method of reporting accidents

b. Procure copy of accident records and accident costs, if possible, and discuss causes and give remedies for preventing each class of accidents

56. Summary of safety conditions:

a. Stress points worthy of special commendation

b. Give concise summary of conditions which appear unsafe

(Note: Any features which bear upon safety and are out of the ordinary, whether in favor of or against safety, should be described fully.)

RECOMMENDATIONS

Recommendations should be brief, numbered, and in accordance with previously stated facts.

Use an introductory statement in recommendations proper stating that "the following recommended changes are believed vital to the safety of the mine, and can be carried out without undue expenditure or wide departure from present mining practice". In general, data on mining practice obtained from sources other than the investigator's own observation should be so indicated.

ACKNOWLEDGMENT

Acknowledgment should be made of courtesies extended by officials.

Name of person making report:

____

Title_________________________

Approved:

____

APPENDIX

The appendix should include copies of dust and air analysis reports, map of mine, American Table of Distances for explosives magazine (if needed), and other notes of general interest.

SPECIAL NOTE.- This outline has been prepared to assist in the collection of data necessary to the writing of safety inspection reports and, it is believed, covers most conditions found in and around coal mines. It was compiled from suggestions made by many of the engineers and field safety instructors of the United States Bureau of Mines. It is not expected that all the data contained in the outline will be included in the report, but all possible data are needed for the preparation of an intelligent report. Detailed descriptions of methods, practices, and equipment are not essential unless some phase is outstanding. The report should call attention to unusually good practices as well as emphasize the hazards observed.